

### ABSTRACT OF THE DISCLOSURE

Described herein is a method to fabricate porous thin-film electrodes for fuel cells and fuel cell stacks. Furthermore, the method can be used for all fuel cell electrolyte materials which utilize a continuous electrolyte layer. An electrode layer is deposited on a porous host structure by flowing gas (for example, Argon) from the bottomside of the host structure while simultaneously depositing a conductive material onto the topside of the host structure. By controlling the gas flow rate through the pores, along with the process conditions and deposition rate of the thin-film electrode material, a film of a pre-determined thickness can be formed. Once the porous electrode is formed, a continuous electrolyte thin-film is deposited, followed by a second porous electrode to complete the fuel cell structure.